

WHAT IS CLAIMED IS:

1 1. A method for distributing data in a data network, wherein the data
2 network connects a plurality of nodes and at least a portion of the plurality of the nodes
3 form a multicast group, wherein one of the nodes in the multicast group is designated a
4 rendezvous node, the method comprising:

5 maintaining a data store containing a group state at each of the nodes in the
6 multicast group;

7 receiving state updates at the rendezvous node;

8 updating the group state in the data store at the rendezvous node with the
9 state updates;

10 propagating the state updates, using a reliable protocol, from the
11 rendezvous node to the other nodes in the multicast group; and

12 updating the group state in the data stores at the other nodes in the
13 multicast group.

1 2. The method of claim 1 wherein a joining node, that is a node of the
2 plurality of nodes, is added to the multicast group, the joining node having a data store,
3 the method further comprising steps of:

4 propagating the group state to the joining node; and

5 updating the data store at the joining node with the group state.

1 3. The method of claim 2 wherein the step of propagating the group
2 state comprises a step of propagating the group state to the joining node from a selected
3 node in the multicast group.

1 4. The method of claim 3 wherein the step of propagating the group
2 state comprises a step of propagating the group state to the joining node from a selected
3 node in the multicast group that is closest to the joining node.

1 5. The method of claim 3 wherein the step of propagating the group
2 state comprises a step of propagating the group state to the joining node from a selected
3 node in the multicast group, wherein the selected node is determined from a network
4 routing protocol.

1 6. A processing agent for processing data at a node in a data network,
2 wherein the data network connects a plurality of nodes and at least a portion of the
3 plurality of the nodes form a multicast group, wherein one of the nodes in the multicast
4 group is designated a rendezvous node, the processing agent comprising:

5 a state memory; and

6 a protocol processor having logic to couple to a selected node in the data
7 network, and having logic to transmit and receive data with other processing agents in the
8 data network over a data channel using a reliable protocol, the protocol processor couples
9 to the state memory and has logic to store and retrieve the data to and from the state
10 memory, respectively.

1 7. The processing agent of claim 6 wherein the selected node is a
2 selected node in the multicast group and wherein the protocol processor further
3 comprises:

4 logic to receive data from at least a first processing agent in the multicast
5 group over the data channel;

6 logic to update the state memory with the data; and

7 logic to transmit the data over the data channel to at least a second
8 processing agent associated with the multicast group.

1 8. The processing agent of claim 6 further comprising a packet
2 forwarding engine, the packet forwarding engine coupled to the protocol processor, the
3 state memory and the selected node, the packet forwarding engine comprising:

4 logic to retrieve the data from the state memory;

5 logic to receive data packets transmitted on the data network;

6 logic to process the received data packets based on the retrieved data from
7 the state memory to form an output data stream; and

8 logic to transmit the output data stream on the data network.

1 9. The processing agent of claim 8 wherein the packet forwarding
2 engine has logic to process the received data packets based on priority information
3 obtained from the retrieved data from the state memory.

1 10. A method for operating a processing agent coupled to a selected
2 node in a data network, wherein the data network connects a plurality of nodes and at

least a portion of the plurality of the nodes, including the selected node, form a multicast group, wherein one of the nodes in the multicast group is designated a rendezvous node, the method comprising steps of:

- receiving data over a data channel;
- updating a state memory with the data; and
- propagating the data over the data channel to other processing agents in the multicast group using a reliable protocol.

11. The method of claim 10 wherein a joining node, that is a child peer to the selected node, joins the multicast group, the method further comprising steps of:

- receiving an indication that the joining node has joined the multicast group; and
- propagating data from the state memory to the joining node over the data channel using a reliable protocol.

12. The method of claim 10 further comprising the steps of:

- receiving a query from a requestor in the data network, regarding data in the state memory; and
- transmitting at least a portion of the data in the state memory to the requestor over the data channel in response to the query.

13. A data network for transmitting data, wherein the data network connects a plurality of nodes and at least a portion of the plurality of the nodes form a multicast group, wherein one of the nodes in the multicast group is designated a rendezvous node, the data network comprising:

- a plurality of processing agents, each of the processing agents having a state memory, wherein each processing agent is coupled to a corresponding node in the multicast group;
- means for receiving data at the processing agent coupled to the rendezvous node;
- means for updating the state memory of the processing agent coupled to the rendezvous node with the data;
- means for propagating the data from the state memory of the processing agent coupled to the rendezvous node to all other processing agents in the multicast group; and

15 means for updating the state memories of all other processing agents in the
16 multicast group with the data.

1 14. The method of claim 13 wherein a joining node, that is a node of
2 the plurality of nodes, is added to the multicast group, the joining node having a data
3 store, the method further comprising steps of:
4 propagating the data to the joining node using a reliable protocol; and
5 updating the data store at the joining node with the data.

1 15. The method of claim 13 wherein the means for propagating
2 comprises logic at each of the processing agents to implement a data channel using a
3 reliable protocol.